AlfaBlue Condensers

General Contents

General Features

All products are designed to satisfy both commercial and industrial refrigeration, air conditioning, and retail refrigeration. All axial condensers are available in the following versions:

- Vertical installation (V)
- Horizontal installation (H)
- Most common refrigerant HFC, such as R404A, R507C, R407C, R134a
- A dedicated product line is available for the natural refrigerant NH_3

Relative footprint, low consumption and low noise levels are the keys to this series' success.

Certifications and reliability

All Air Cooled condensers are guaranteed by Eurovent "Certify All". Alfa Laval quality systems fully comply with ISO 9001, and all of our products are manufactured in strict accordance with CE regulations.

Capacity

The standard conditions are in accordance with EN 327 (R404A, T. air = 25°C, T.cond.= 40°C, ΔT sub-cool < 3K, ΔT superheat = 25K).

How to work out the condenser's capacity:

$$Qc = Qf \times Fr \times F1 \times F2 \times F3 \times F4 \times F5 \times F6$$

Qc = Condenser capacity
Qf = Evaporator capacity
Fr = Condensing Temp (Tc) and evaporating Temp factor. (Te).
F1 = Compressor factor
F2 = Refrigerant factor
F3 = ΔT factor (15/ΔT)
F4 = Altitude factor
F5 = Fin material
F6 = Ambient temperature factor

Compressor	Open	Semi-hermetic	Hermetic
F1	1	1,08	1,14

Refrigerant	R507A	R404A	R134a	R22	R407C
F2	1	1	0,93	0,96	0,87

Altitude (m)	0	500	1000	1500	2000
F4	1	1,028	1,06	1,09	1,12

Fin material	Al	Al Prv	Cu
F5	1	1,03	0,97

Ambient Temp.	15	20	25	30	35
F6	0,975	0,988	1,00	1,013	1,026

Tube Protection

Due to the thermal expansion of the copper pipes, all metal sheets are equipped with an aluminium plate with collars. This plate supports the tube and therefore the pipes must not come into contact with the metal sheets. With this solution, the vibrations and thermal expansion are absorbed by the aluminium sheet. Leaks caused by friction cannot occur. The rigidity of the coil is sustained effectively.

Energy Efficiency Class

Energy efficiency class of air cooled condensers		
Class	Energy consumption	R
A	Extremely low	R>110
B	Very low	70≤R<110
C	Low	45≤R<70
D	Medium	30≤R<45
E	High	R<30
R = Condenser capacity (ΔT15K) / motor power consumption.		

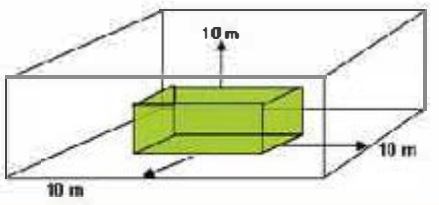
Test and cleaning

The coils are cleaned and dehydrated in order to remove any traces of oil.

Each heat exchanger undergoes a pressure and leak test with dry air at 34 bar, before being supplied with a nitrogen pre-charge.

Sound Data

The sound pressure level is based on the calculation (according to EN 13487) of the sound pressure level on the surface of a cuboid area which is at a 10 metre distance and is parallel to the reference envelope of the sound source. (Standard sound pressure level; annex C EN 13487)



Sound pressure correction for distances other than 10 metres.

Distance (m)	2	3	4	5	7	10	15	20	30	40	50	60	80
Correction dB(A)	11	8,5	7	5	2,5	0	-3	-5,5	-9	-11	-12	-14	-16

Sound pressure level for several fans at nominal speed rating.

N° units	2	3	4	5	6	7	8	9	10
dB(A)	3	5	6	7	8	8,5	9	9,5	10

To calculate the sound pressure level, take the sound power of the individual fans according to their position, and calculate the sound propagation taking into consideration the local and ambient conditions. Speed change, start-up and control noises are not taken into account.

Fan Model	Speed rpm		Total Lw dB(A)		LW octave band spectrum dB(A)															
					63Hz		125Hz		250Hz		500Hz		1 000Hz		2 000Hz		4 000Hz		8 000Hz	
Connection	Δ	Y	Δ	Y	Δ	Y	Δ	Y	Δ	Y	Δ	Y	Δ	Y	Δ	Y	Δ	Y	Δ	Y
630 S	1340	1070	90	84	-	-	68	66	76	72	78	74	83	77	81	76	78	72	70	65
630 L	900	690	77	71	-	-	62	55	69	63	72	65	75	68	72	63	64	56	58	50
630 Q	650	480	70	62	-	-	51	48	60	55	63	58	65	59	60	53	53	47	46	45
630 R	430	330	60	54	-	-	46	45	53	47	54	51	53	49	48	43	43	40	42	41
800 S	880	660	83	76	-	-	69	56	67	62	74	69	78	74	79	72	72	64	62	54
800 L	680	530	76	71	-	-	57	49	62	57	69	63	74	68	72	63	65	55	55	46
800 Q	440	340	66	60	-	-	47	42	57	48	59	54	63	56	58	51	50	43	39	34
800 R	380	240	63	52	-	-	47	42	54	44	57	47	59	48	55	42	47	34	35	26
910 T	890	700	90	83	-	-	72	70	79	73	82	76	84	79	82	76	79	73	73	66
910 S	860	660	85	79	-	-	72	70	79	73	82	76	84	79	82	76	79	73	73	66
910 L	640	440	78	70	-	-	68	62	73	65	76	70	77	70	76	70	73	67	66	60
910 Q	440	330	68	62	-	-	57	49	61	58	64	57	67	60	61	53	52	45	43	35
910 R	390	250	65	53	-	-	56	46	59	45	59	46	61	49	56	44	48	35	38	22
1000 L	680	550	86	81	-	-	58	53	68	60	70	63	73	68	75	67	71	62	62	53
1000 Q	425	325	72	65	-	-	50	45	58	50	62	54	65	58	60	50	54	42	44	30
1000 R	390	260	70	61	-	-	50	44	56	45	60	49	64	52	55	44	48	36	37	25

Guarantee

All our products are protected under warranty for 18 months from the shipping date. If a defect should occur within the warranty period, please return the equipment or part to our factory free of charge where we will repair or replace the goods, depending on what is required. Unfortunately, We cannot take responsibility for damage caused by the misuse or incorrect installation of our products. The brochure is subject to technical changes without prior notice

We recommend that you use the Alfa Select Air software for a precise thermal and mechanical design.

BCM - Single Fan Row

Product description

Application
The Alfa Laval Condenser can be used in refrigeration and air conditioning equipment

Standard design

Coil
The innovative heat exchanger gives excellent heat transfer with minimised refrigerant charge, thanks to the new fin corrugations developed by Alfa Laval, combined with advance cross-fin tubes. The standard heat exchanger is manufactured from copper tubes and aluminium fins with 2.1mm spacing.

Casing
Casework made with pre-painted galvanized steel sheets. A new frame design provides high rigidity for heavy applications. The new system protects the heat exchanger tubes completely during transportation and against vibration and thermal expansion while in operation.

Supports manufactured in galvanized steel, with optimized length to permit uniform air suction in the coil.

Benefits
- Footprint: optimized footprint with higher capacity
- 630, 800, 910, 1000 mm fan:
  - More performance available
  - Low power consumption fan motor
  - More options on noise levels
  - Flexible design
- RAL 9002 all parts painted:
  - No cut edges
  - Higher corrosion resistance, double surface treatment
  - External Corrosion Class C4
- Coil design: increased heat transfer thanks to innovative fin corrugations
- Casing: strong casing with new design
- High Energy Efficiency: best performance with low energy consumption

Options
- Non-standard fin spacing: for heavy dusty environment
- Multi-circuits: total capacity split in multiple compressor lines
- Sub-cooling circuit. Additional circuit to further cool the condensate
- Coil treatment: corrosion resistance, ideal for aggressive environments
- Vibration Dampers: for reducing vibrations
- Electrical parts:
  - Switch on/off: local safety switch wired to isolate the fan and also the switch EMC type
  - Terminal Box: all fans wired for an easy electrical connection
  - Switchboard
- Cabling: ready to install
- Frequency Converter design: units can run under frequency control (when air temperature is below the design, it allows energy saving, noise reduction and longer fan motor life)
- Fan Step Control:
  - Energy saving
  - Cheapest method of controlling performance
- Fan Speed Control:
  - Energy saving
  - Noise reduction when the air temperature is below the design temperature.
  - Variable and efficient speed control according to the heat rejected
  - Better performance control
- Special fans:
  - 480/3ph-60Hz IP54 : High adaptability for every market
  - IP 55: High protection fan for use in tropical or desert areas
  - High temperature Electric Motors: for use when the air temperature is higher than permitted for the use of standard fans.

Fans

Four different fan diameters are available for the BCM: 630, 800, 910, 1000 mm. Diameter 630, 800, 910, 1000 mm with three-phase motor 400V-50Hz, for 630 (L, Q, R) also single-phase 230V-50Hz. The motors come with external rotors, protection class IP 54 according to DIN 40050. This Axial Condenser BCM is available in five noise levels: (S) standard, (L) low, (Q) quiet, (R) residential and the new (T) high performance fan. The motors are fitted with a thermal contact. The fans are suitable for operation in air temp. application between -40°C and +40°C.

For air temperature lower then +20°C, the full load current (FLC) can be calculated by using the correction factor table. The overload protectors should have a 20% margin to accommodate fan motor supplier variations.

T [°C]	20	10	0	-10	-15	-20	-25	-30
Fc	1	1,04	1,08	1,12	1,14	1,16	1,18	1.2

Model	Capacity [kW]		Airflow [m³/h]		I.p [dB(A)]*		Motor (3/400V-50Hz)		Fans	E.E.C.**		Sur-face	Tube volume	Conn. Size	
	Δ	Y	Δ	Y	Δ	Y	Δ	Y	N° x D [mm]	Δ	Y	m²	dm³	mm	
														Inlet	Outlet
Ø 800															
BCMS 801 B	81,9	66,9	20650	15935	51	46	P=2000W In=4A n=880min-1	P=1250W In=2.3A n=680min-1	1X800	C	C	147,6	21	42	28
BCMS 801 C	87,4	69,5	19748	15071	51	46			1X800	C	C	196,8	28	42	28
BCMS 802 B	163,2	133,2	41166	31739	54	49			2X800	C	C	291	43	54	42
BCMS 802C	174,0	138,2	39330	29988	54	49			2X800	C	C	388,1	56	60	48
BCMS 803A	174,0	151,6	66791	52721	56	51			3X800	D	D	492,2	43	60	48
BCMS 803 B	218,5	187,1	64848	50701	56	51			3X800	D	C	738,3	64	76	54
BCMS 803 C	246,0	204,7	62929	48767	56	51			3X800	C	C	984,5	86	76	54
BCMS 804 A	237,8	207,4	89034	70272	57	52			4X800	D	D	654,8	57	76	54
BCMS 804 B	295,0	249,9	86432	67570	57	52			4X800	D	C	982,1	86	76	54
BCMS 804C	329,0	271,6	83865	64983	57	52			4X800	C	C	1309,5	114	76	54
BCMS 805A	296,6	260,0	111277	87824	58	53			5X800	D	D	817,3	71	76	54
BCMS 805B	369,9	314,4	108017	84438	58	53			5X800	D	C	1225,9	107	88,9	60
BCMS805C	413,5	342,1	104800	81199	58	53			5X800	C	C	1634,6	143	88,9	60
BCML 801 A	58,0	50,1	16637	13586	44	40	P=1050W In=2,4A n=680min-1	P=770W In=1,5A n=530 min-1	1X800	C	B	98,4	14	35	28
BCML 801 B	66,9	56,0	15917	12802	44	40			1X800	B	B	147,6	21	42	28
BCML801 C	70,1	57,7	15229	12102	44	40			1X800	B	B	196,8	28	42	28
BCML 802A	115,5	99,7	33205	27093	47	43			2X800	C	B	194	28	54	42
BCML 802B	133,1	111,3	31733	25497	47	43			2X800	B	B	291	43	54	42
BCML 802C	139,6	114,6	30331	24078	47	43			2X800	B	B	388,1	56	60	48
BCML 803A	149,2	132,4	51369	42463	49	45			3X800	C	C	492,2	43	60	48
BCML 803B	185,3	161,1	49933	40781	49	45			3X800	C	B	738,3	64	76	54
BCML 803C	203,8	172,8	48493	39192	49	45			3X800	B	B	984,5	86	76	54
BCML 804 A	204,2	181,4	68476	56599	50	46			4X800	C	C	654,8	57	76	54
BCML 804B	247,2	213,6	66554	54348	50	46			4X800	C	B	982,1	86	76	54
BCML 804C	270,5	229,6	64627	52223	50	46			4X800	B	B	1309,5	114	76	54
BCML 805A	256,1	228,2	85584	70735	51	47			5X800	C	C	817,3	71	76	54
BCML 805B	311,1	269,3	83175	67916	51	47			5X800	C	B	1225,9	107	88,9	60
BCML 805 C	340,7	287,9	80760	65254	51	47			5X800	B	B	1634,6	143	88,9	60
BCMQ 801 A	40,6	33,1	10297	7974	35	28	P=370W In=1,2A n=440min-1	P=200W In=0,5A n=340 min-1	1X800	A	A	98,4	14	35	28
BCMQ801 B	44,8	35,6	9772	7465	35	28			1X800	A	A	147,6	21	42	28
BCMQ801 C	45,6	35,3	9281	7025	35	28			1X800	A	A	196,8	28	42	28
BCMQ 802A	80,7	65,8	20542	15896	38	31			2X800	A	A	194	28	54	42
BCMQ 802 B	89,1	70,8	19470	14862	38	31			2X800	A	A	291	43	54	42
BCMQ 802C	90,8	70,2	18473	13973	38	31			2X800	A	A	388,1	56	60	48
BCMQ 803A	109,9	94,8	31968	25077	40	33			3X800	B	A	492,2	43	60	48
BCMQ 803B	131,1	106,9	30906	23938	40	33			3X800	A	A	738,3	64	76	54
BCMQ 803C	138,1	110,7	29852	22899	40	33			3X800	A	A	984,5	86	76	54
BCMQ 804 A	150,2	126,4	42613	33424	41	34			4X800	A	A	654,8	57	76	54
BCMQ 804 B	173,7	143,7	41191	31900	41	34			4X800	A	A	982,1	86	76	54
BCMQ 804C	186,0	148,8	39780	30510	41	34			4X800	A	A	1309,5	114	76	54
BCMQ 805A	189,6	159,8	53258	41770	42	35			5X800	A	A	817,3	71	76	54
BCMQ 805B	218,2	178,7	51475	39862	42	35			5X800	A	A	1225,9	107	88,9	60
BCMQ 805 C	231,3	185,1	49708	38122	42	35			5X800	A	A	1634,6	143	88,9	60
BCMR801 A	35,8	24,8	8803	5529	31	20	P=250W In=0,62A n=380min-1	P=110W In=0,27A n=240 min-1	1X800	A	A	98,4	14	35	28
BCMR 801 B	39,0	25,4	8300	5128	31	20			1X800	A	A	147,6	21	42	28
BCMR 802A	71,3	49,3	17555	11016	34	23			2X800	A	A	194	28	54	42
BCMR 802 B	77,7	50,5	16532	10203	34	23			2X800	A	A	291	43	54	42
BCMR 803A	100,5	74,0	27485	17496	36	25			3X800	A	A	492,2	43	60	48
BCMR 803 B	115,9	79,3	26423	16599	36	25			3X800	A	A	738,3	64	76	54
BCMR 803 C	120,9	79,2	25407	15779	36	25			3X800	A	A	984,5	86	76	54
BCMR 804 A	135,1	98,3	36636	23318	37	26			4X800	A	A	654,8	57	76	54
BCMR 804 B	155,0	106,5	35214	22118	37	26			4X800	A	A	982,1	86	76	54
BCMR804 C	162,7	106,1	33855	21022	37	26			4X800	A	A	1309,5	114	76	54
BCMR 805 A	170,7	122,1	45786	29140	38	27			5X800	A	A	817,3	71	76	54
BCMR 805 B	192,6	132,5	44005	27637	38	27			5X800	A	A	1225,9	107	88,9	60
BCMR 805C	202,4	132,2	42303	26265	38	27			5X800	A	A	1634,6	143	88,9	60

Nominal capacities according to standard ENV327(R404A Tair=25°C, Tcond=40°C,ΔTsubcool<3K, ΔTsuperheal=25K).

*See "General Contents" for more details.

**Energy Efficiency Class: see "General Contents" for more details.

BCM/BNM - Single Fan Row

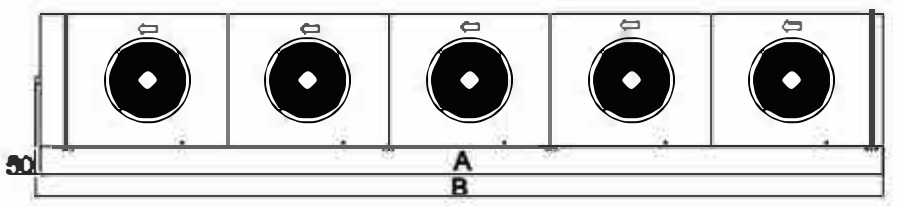
Drawings

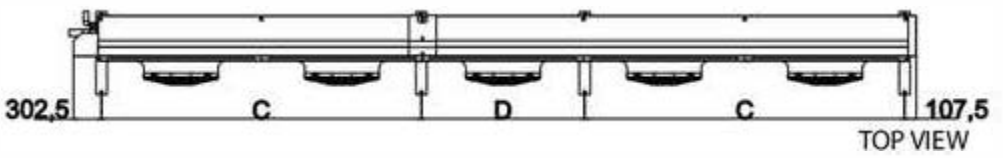
Model	Weight [kg]	Dimensions (mm)					N° feet	
		A	B	C	D	G	V	H
Ø 630								
BCM_631 A	110	1475	1525	1065(V)/944(H)	-	1255(V)/1220(H)	2	4
BCM_631 B	120	1475	1525	1065(V)/944(H)	-	1255(V)/1220(H)	2	4
BCM_631 C	130	1475	1525	1065(V)/944(H)	-	1255(V)/1220(H)	2	4
BCM_632 A	220	2565	2615	2155(V)/2084(H)	-	1255(V)/1220(H)	2	4
BCM_632 B	240	2565	2615	2155(V)/2084(H)	-	1255(V)/1220(H)	2	4
BCM_632 C	260	2565	2615	2155(V)/2084(H)	-	1255(V)/1220(H)	2	4
BCM_633 A	340	3655	3705	3245(V)/3174(H)	-	1255(V)/1220(H)	2	4
BCM_633 B	365	3655	3705	3245(V)/3174(H)	-	1255(V)/1220(H)	2	4
BCM_633 C	390	3655	3705	3245(V)/3174(H)	-	1255(V)/1220(H)	2	4
BCM_634 A	450	4745	4795	2155(V)/2084(H)	2180	1255(V)/1220(H)	3	6
BCM_634 B	485	4745	4795	2155(V)/2084(H)	2180	1255(V)/1220(H)	3	6
BCM_634 C	520	4745	4795	2155(V)/2084(H)	2180	1255(V)/1220(H)	3	6
Ø 630 LONG								
BCM_631 AL	140	1785	1835	1375(V)/1304(H)	-	1255(V)/1220(H)	2	4
BCM_631 BL	155	1785	1835	1375(V)/1304(H)	-	1255(V)/1220(H)	2	4
BCM_631 CL	170	1785	1835	1375(V)/1304(H)	-	1255(V)/1220(H)	2	4
BCM_632 AL	285	3185	3235	2775(V)/2104(H)	-	1255(V)/1220(H)	2	4
BCM_632 BL	310	3185	3235	2775(V)/2104(H)	-	1255(V)/1220(H)	2	4
BCM_632 CL	335	3185	3235	2775(V)/2104(H)	-	1255(V)/1220(H)	2	4
BCM_633 AL	440	4585	4635	4175(V)/4104(H)	-	1255(V)/1220(H)	2	4
BCM_633 BL	470	4585	4635	4175(V)/4104(H)	-	1255(V)/1220(H)	2	4
BCM_633 CL	500	4585	4635	4175(V)/4104(H)	-	1255(V)/1220(H)	2	4
Ø 800								
BCM_801 A	175	2135	2185	1725(V)/1664(H)	-	1495(V)/1250(H)	2	4
BCM_801 B	195	2135	2185	1725(V)/1664(H)	-	1495(V)/1250(H)	2	4
BCM_801 C	215	2135	2185	1725(V)/1664(H)	-	1495(V)/1250(H)	2	4
BCM_802 A	350	3885	3935	3475(V)/3404(H)	-	1495(V)/1250(H)	2	4
BCM_802 B	390	3885	3935	3475(V)/3404(H)	-	1495(V)/1250(H)	2	4
BCM_802 C	430	3885	3935	3475(V)/3404(H)	-	1495(V)/1250(H)	2	4
BCM_803 A	540	5635	5685	5225(V)/5154(H)	-	1495(V)/1250(H)	2	4
BCM_803 B	600	5635	5685	5225(V)/5154(H)	-	1495(V)/1250(H)	2	4
BCM_803 C	660	5635	5685	5225(V)/5154(H)	-	1495(V)/1250(H)	2	4
BCM_804 A	720	7385	7435	3475(V)/3404(H)	3500	1495(V)/1250(H)	3	6
BCM_804 B	800	7385	7435	3475(V)/3404(H)	3500	1495(V)/1250(H)	3	6
BCM_804 C	880	7385	7435	3475(V)/3404(H)	3500	1495(V)/1250(H)	3	6
BCM_805 A	900	9135	9185	3475(V)/3404(H)	1775(V)/1846(H)	1495(V)/1250(H)	4	8
BCM_805 B	1000	9135	9185	3475(V)/3404(H)	1775(V)/1846(H)	1495(V)/1250(H)	4	8
BCM_805 C	1100	9135	9185	3475(V)/3404(H)	1775(V)/1846(H)	1495(V)/1250(H)	4	8

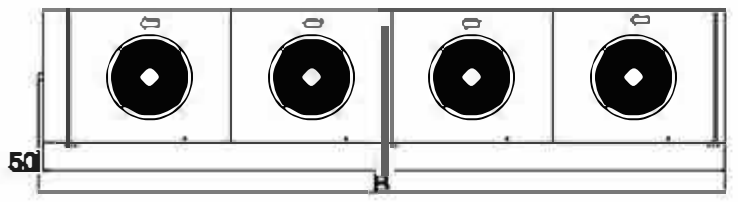
Standard feet 500 mm.

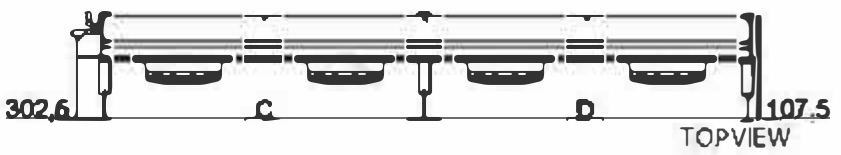
We reserve the right to change our technical data without prior notice.

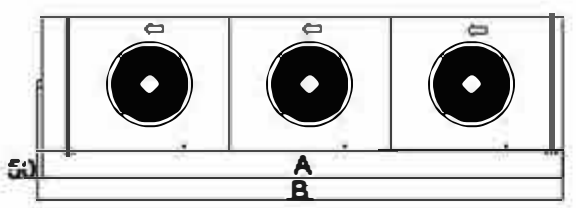
BCM VERTICAL POSITION

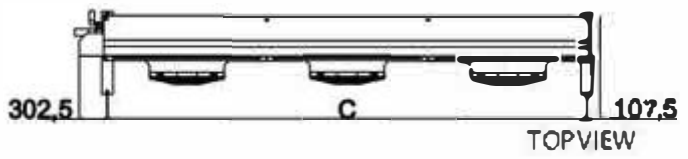


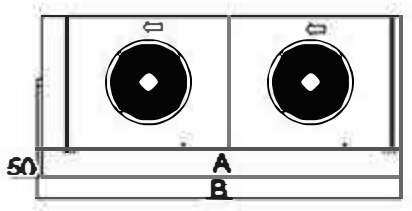


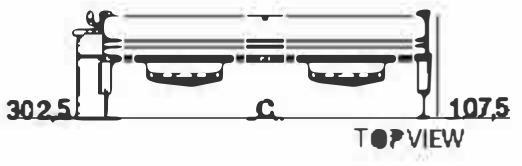


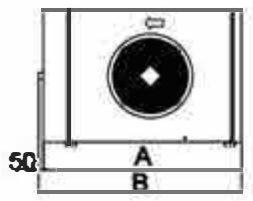


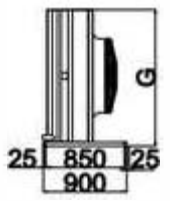


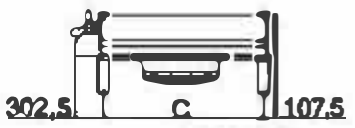




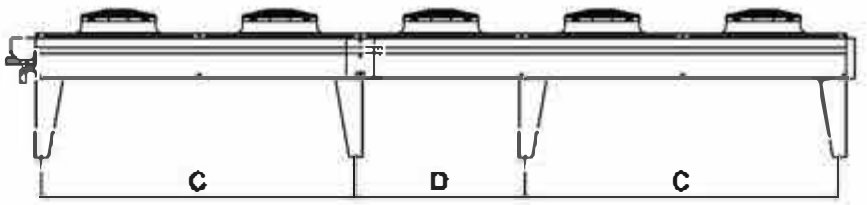


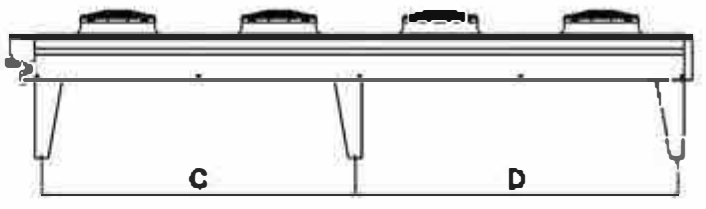


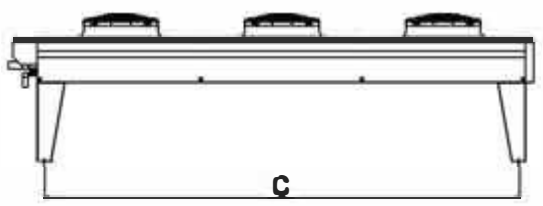


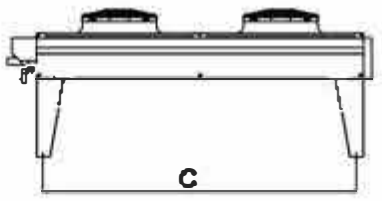


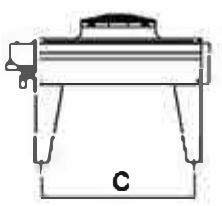
BCM HORIZONTAL POSITION

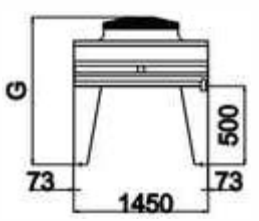












BCM/BNM - Single Fan Row

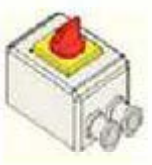
Options

Motor fans

(a) Fan motor 400 V/3ph - 60Hz, IP54: C/R for Ø 630/800/910/1000 and also S/L for Ø 630/800/910
(b) Fan motor 460 V/3ph - 60Hz, IP54: C/R for Ø 630/800/910/1000 and also S/L for Ø 630/800/910
(c) Fan motor 230V/1ph - 50/60Hz, IP54: L/O for Ø 630

Model:
Ø 630 (a,b,c)
Ø 800 (a,b)
Ø 910 (a,b)
Ø 1000 (a,b)

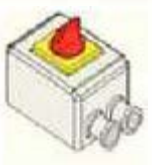
Local safety switch wired



See Electrical Data Page.

Model:
All Models

Local safety switch EMC



See Electrical Data Page

Model:
All Models

Terminal Box

See Electrical Data Page.

Model:
All Models

Switchboard and cabling

Function

Switchboard for supply and control of fan motors.

A switchboard can supply up to 8 individual motors or 8 paired motors (i.e. max. of 16 motors).

Switchboard and cabling are supplied as standard for vertical installation of the unit.

If you have different needs, please specify these when placing your order.

Operating conditions

Type of installation: External wall mounted

protection class: IP55 door closed

Climate: Normal

Operating temperature: -10 ÷ +35°C (base) -25 ÷ +50°C (with options)

Ambient relative humidity: <95%

Altitude: <1000metres above sea level

Electrical data

Insulating nominal voltage: 690V

Operating voltage: 3Ph. 400Vac

Frequency: 50Hz

Auxiliaries voltage: 24230V

Nominal current: Max 80A

Mechanical data

Material: Pre-painted galvanized steel

Fixing plate: Sheet of steel (min. thickness 15/10 Sendzimir galvanized)

Gasket: Polyurethane

Door: opening more than 180°.

Colour: RAL 7035

Cable gland: metric ISO

Model:
All Models

Switchboard Options

R anti-condensate resistor 230Vac (operating temperature -25 ÷ +35°C)

C cooling fan 230Vac (operating temperature -10 ÷ +50°C)

F cooling fan + anti-condensate resistor

Model:
All Models

Switchboard with Fan Speed control

Switchboard and cabling including an electronic fan motor speed controller. This equipment continually checks and regulates the rotation speed of the fan's motor, keeping the condensing pressure within the range or pre-defined values. Constant control of the fan speed is achieved by variation of the electrical supply by phase-cut, as determined by the probe signal. The fan speed controller comes pre-connected to the switchboard. If you have different needs, please specify these when placing your order.

Model:
All Models

Switchboard with Fan Step control

Switchboard and cabling including an automatic on/off switch that checks and regulates the rotation speed of the fan's motor, keeping the condensing pressure within the range or pre-defined values. Control of the fan speed is achieved by variation of the electrical supply by the ON/OFF device, as determined by the probe signal. The fan step controller comes pre-connected to the switchboard. If you have different needs, please specify these when placing your order.

Model:
All Models

Switchboard with Frequency Converter (Inverter)

See Electrical Data Page

Model:
All Models

Coil Treatment / Material

Thermoguard for industrial or sea coast application.

Aluminium fins pre-coated.

Copper fins.

Application Use: More information on corrosion prevention can be found in the Miscellaneous section.

Model:
All Models